Summer 2018

Periodic Atlas of the Metroscape: The Geography of Health

Joshua Ollinger
Portland State University

Ashley Donald
Portland State University

Randy Morris
Portland State University

The Geography of Health

Analyzing the CDC's 500 Cities Dataset in the Metroscape

by Josh Ollinger
Maps by Ashley Donald & Randy Morris

Our ability to lead a fulfilling life and pursue our goals is largely shaped by our health. Although we experience these conditions such as illness and disabilities at a very personal level, factors outside of our control are often what determines our health. Known as the Social Determinants of Health, where we are born, work, live, and spend our lives is considered equally if not more important to our health status than medical care and personal health behaviors.[1] As a result, certain communities and populations disproportionately experience burdens. Identifying and increasing awareness of health disparities is an essential step toward improving the health status of all Metro-area residents.

The 500 Cities Project, a partnership between The Robert Wood Johnson Foundation, CDC Foundation, and the Centers for Disease Control and Prevention (CDC), provides surveillance data to better explore and visualize health disparities affecting urban residents within the United States. Using a multilevel statistical modeling framework, the project predicts individual disease risk and health behaviors, and estimates the geographic distributions of population disease burden and health behaviors.[2]

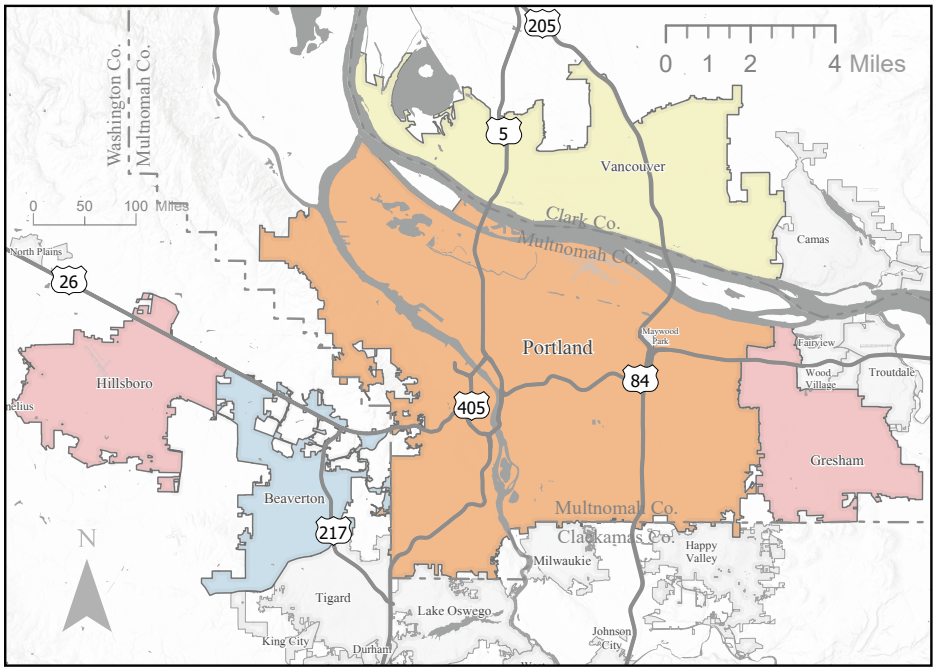

Figure 1

Here we examine six of twenty-seven available measures related to health inequity including two health outcomes, two unhealthy behaviors, and two preventative measures. As the 500 Cities Project only covers the largest US cities, the study area within the Portland-Vancouver Metropolitan Statistical Area looks at Portland, Vancouver, Gresham, Hillsboro, and Beaverton. Each of these six maps also includes a chart showing how the Portland-Vancouver area fares compared to a selection of cities across the country with similar economic

1. Theodore R. R. Mormor, Morris L. Barer, and Robert G. Evans, *Why Are Some People Healthy and Others Not?: The Determinants of Health of Populations (Social institutions and Social Change),* (New Jersey: Aldine Transaction, 1994).
2. Centers for Disease Control and Prevention, "Introduction: CDC Health Disparities and Inequalities Report —United States, 2013," *MMWR*, 62, Suppl.3 (2013).

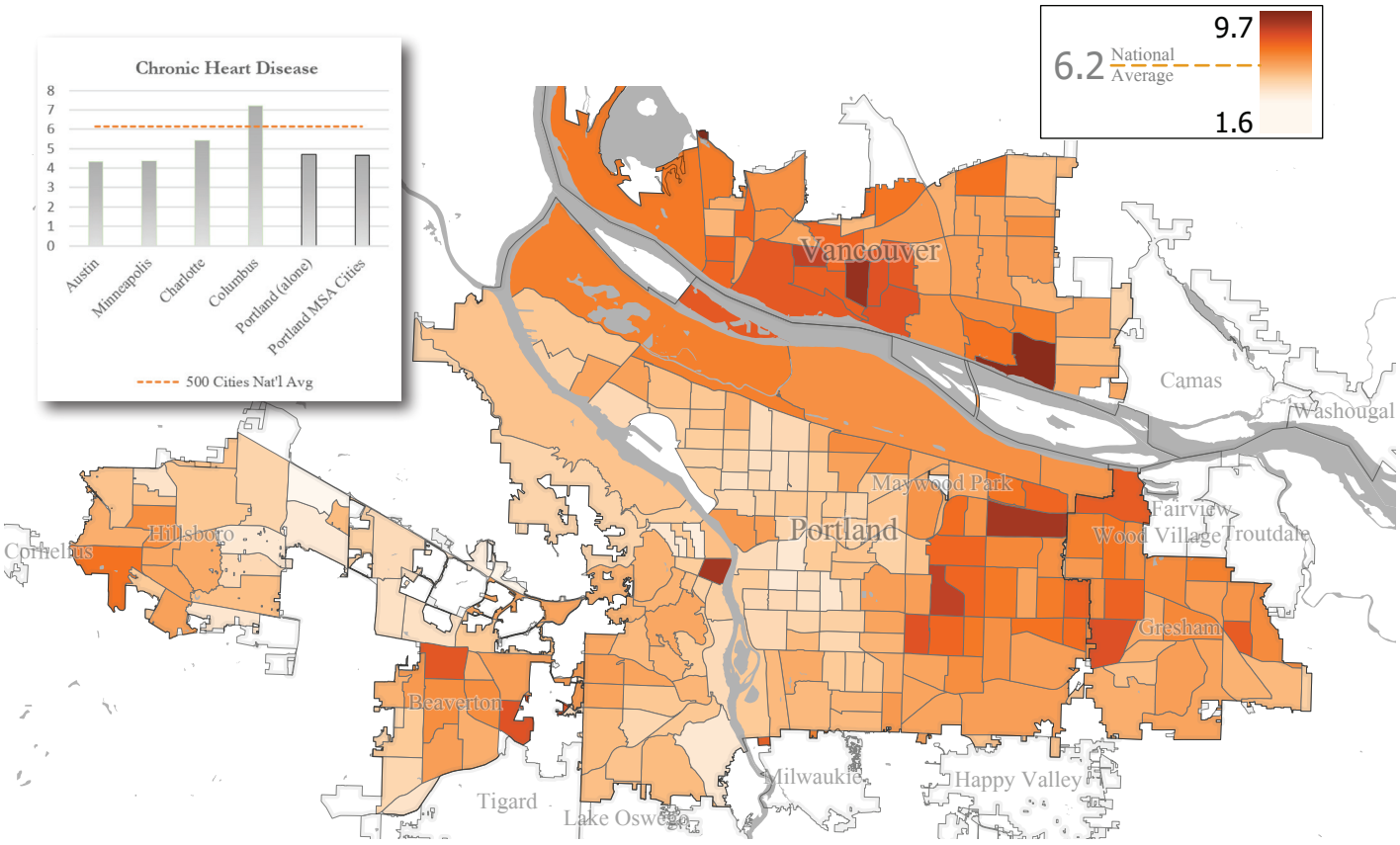

Figure 2

and demographic characteristics,[3] as well as to the 500 Cities national average.

The Atlas article concludes with a Social Vulnerability Index (SVI) map, providing the reader an opportunity to compare the 500 Cities results with a map of composite scores based on demographic indicators. The SVI indicators show data at the Census tract level derived from the 2016 five-year American Community Survey, and include percent values for non-white population, unemployment, bachelor's degree attainment, home cost burden, rent cost burden, dependency (ages zero to four, and sixty-five and over), and disability.

3. Website of the Federal Reserve Bank of Chicago, "Peer City Identification Tool," (n.d.), https://www.chicagofed.org/region/community-development/data/pcit.

Health Outcomes

Health outcomes can be thought of as "the results that matter most to patients."[4] That is, health outcomes are the diseases and conditions that reflect our state of physical, mental, and social well-being.[5]

Chronic Obstructive Pulmonary Disease

Chronic obstructive pulmonary disease (COPD) is a chronic lung disease that is the third leading cause of death in the United States.[6] Nearly 80 percent of COPD deaths are attributable to smoking,[7] while other

4. Website of ICHOM, "Mission," (n.d.), http://www.ichom.org/.
5. R. Gibson Parrish, "Measuring Population Health Outcomes," *Preventing Chronic Disease,* 7, no. 4 (2010): A71.
6. Website of the American Lung Association, "Lung Health & Diseases," (n.d.), http://www.lung.org/lung-health-and-diseases/lung-disease-lookup/copd/.
7. B. Adhikari et al., "Smoking-Attributable Mortality, Years of Potential Life Lost, and Productivity Losses—United States,

risk factors include occupational exposure, ambient air pollution, and long-term severe asthma.[8]

High Blood Pressure

High blood pressure, or hypertension, is a leading contributor to critical public health issues in the United States. Approximately 20 to 30 percent of coronary heart disease (leading cause of death in U.S.) and 20 to 50 percent of strokes (fifth leading cause of death in United States) are attributable to hypertension.[9] Leading causes of hypertension include smoking tobacco, eating foods with high sodium intake or low potassium, physical inactivity, obesity, and excessive alcohol consumption.[10]

Unhealthy Behaviors

Unhealthy behaviors, or behavioral risk factors, are detrimental to an individual's physical or mental health and can lead to poor health outcomes.[11] Unhealthy behaviors are implicated in up to 40 percent of premature deaths in the United States.[12]

No Leisure Time Physical Activity

Physical activity during leisure time includes any activity outside of work with physical movements

2000–2004," *JAMA,* 301. no. 6 (2009): 593–594.
8. Mannino, & Holguin, "Epidemiology and Global Impact of Chronic Obstructive Pulmonary Disease," *Respiratory Medicine: COPD,* 1, no.. 4 (2006): 114–120.
9. Go et al., "Heart Disease and Stroke Statistics—2013 Update: A Report From the American Heart Association," *Circulation*, 127, no. 1 (2012): E6–E245.

10. Ibid.
11. "Unhealthy Habit," *McGraw-Hill Concise Dictionary of Modern Medicine,* (2002), https://medical-dictionary.thefreedictionary.com/Unhealthy+Habit.
12. Ali H. Mokdad et al., "Actual Causes of Death in the United States, 2000," *JAMA,* 291, no. 10 (2004): 1238–1245.

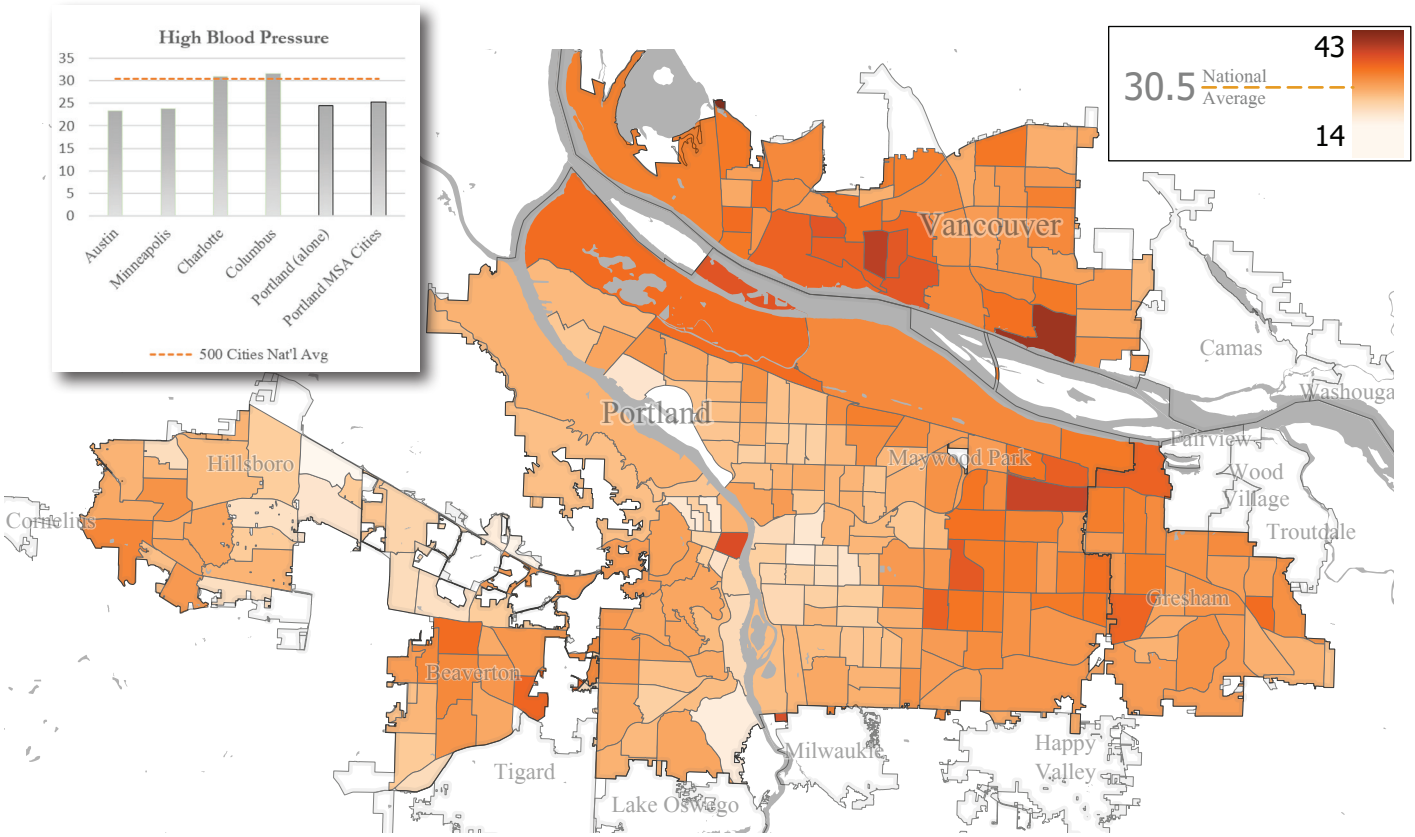

Figure 3

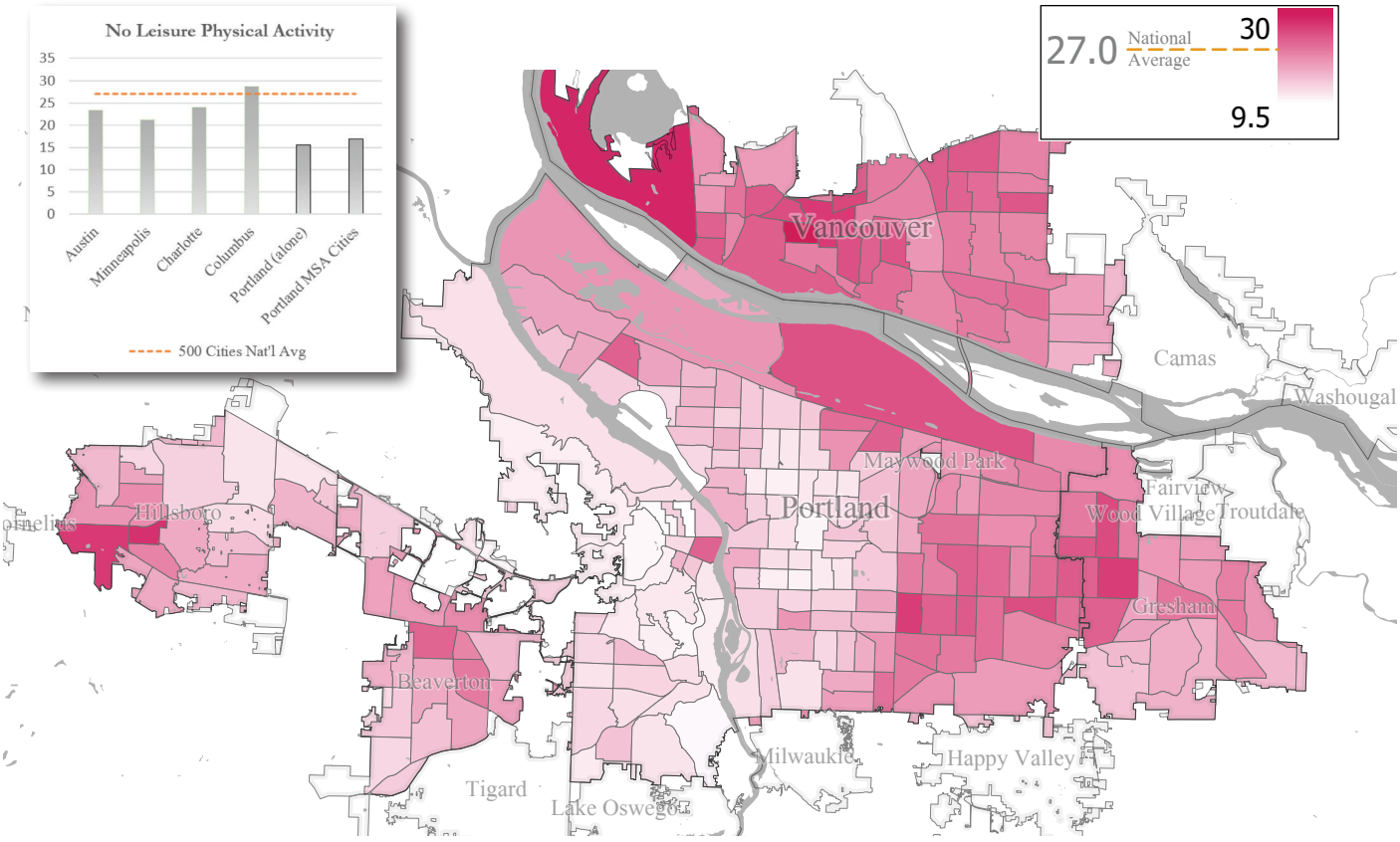

Figure 4

that improve health and quality of life such as exercise, gardening, or walking to work.[13] An insufficient amount of physical activity is a leading risk factor for premature death due to diseases such as heart disease, cancer, stroke, and type 2 diabetes.[14]

Sleeping Less than Seven Hours

As defined in the 500 Cities measure, individuals experiencing insufficient sleep report usually sleeping fewer than seven hours a night.[15] Insufficient sleep has been connected to reducing productivity (e.g., poor work or academic performance), can reduce an individual's quality of life,[16] and has been associated with major chronic diseases and conditions, such as diabetes, cardiovascular disease, high blood pressure, obesity, and depression.[17]

Prevention

Prevention is at the core of public health work.[18] Public health work is largely focused on preventing poor health outcomes and unhealthy behaviors before they lead to individuals becoming sick or injured.

Lack of Health Insurance

Lack of health insurance is a major barrier to accessing health services and preventative services.[19] Uninsured

13. Website of the World Health Organization, "Physical Activity," (2018) http://www.who.int/en/news-room/fact-sheets/detail/physical-activity.
14. United States. Department of Health Human Services, "2008 Physical Activity Guidelines for Americans: Be Active, Healthy, and Happy!" ODPHP publication; no. U0036.
15. Website of the Centers for Disease Control and Prevention, "500 Cities: Local Data for Better Health," (2017), https://www.cdc.gov/500cities/methodology.htm.
16. H. R. Colten, Bruce M. Altevogt, and Institute of Medicine. Committee on Sleep Medicine Research, "Sleep Disorders and Sleep Deprivation an Unmet Public Health Problem," (Washington, DC: National Academies Press, 2004).
17. Ibid.
18. Website of the CDC Foundation, "What is Public Health?," (n.d.), https://www.cdcfoundation.org/what-public-health.
19. J. Weissman et al., "Delayed Access to Health Care: Risk Factors, Reasons, and Consequences," *Annals of Internal Medicine,* 114, no. 4 (1991): 325–31.

individuals are associated with poorer health status,[20] are more likely to be hospitalized for preventable illnesses and conditions, and can be burdened with insurmountable debt from medical bills.[21]

Papanicolaou Test

The Papanicolaou test, or Pap smear, is a screening procedure for women to detect cervical cancer. It has been estimated that increased use of the Pap smear (recommended once every three years) could lead to timely and effective treatment and ultimately the prevention of approximately 40 to 60 percent of cervical cancer deaths.[22]

20. J. Weissman et al., "Delayed Access to Health Care: Risk Factors, Reasons, and Consequences," *Annals of Internal Medicine,* 114, no. 4 (1991): 325–31.
21. Ibid.
22. "Practice Bulletin No. 131: Screening for Cervical Cancer," *Obstetrics & Gynecology,* 120, no. 5, 1222–1238.

Social Vulnerability

The social vulnerability indicators are largely reflective of the social determinants of health—conditions in our social, economic, and physical environments that affect a wide range of health risks and outcomes.[23]

Analysis

By all seven measures, the Metro area ranked healthier than the 500 Cities average. However, local tracts that are more likely to experience poor health outcomes, practice unhealthy behaviors, and are less likely to seek preventative services, are consistently concentrated in the same areas throughout the maps. The Portland-Gresham border, North Beaverton, East Hillsboro, and the downtown Portland tracts all indicate higher potential for residents to experience health dispari-

23. Website of the Office of Disease Prevention and Health Promotion, "Social Determinants of Health," (2018), https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health.

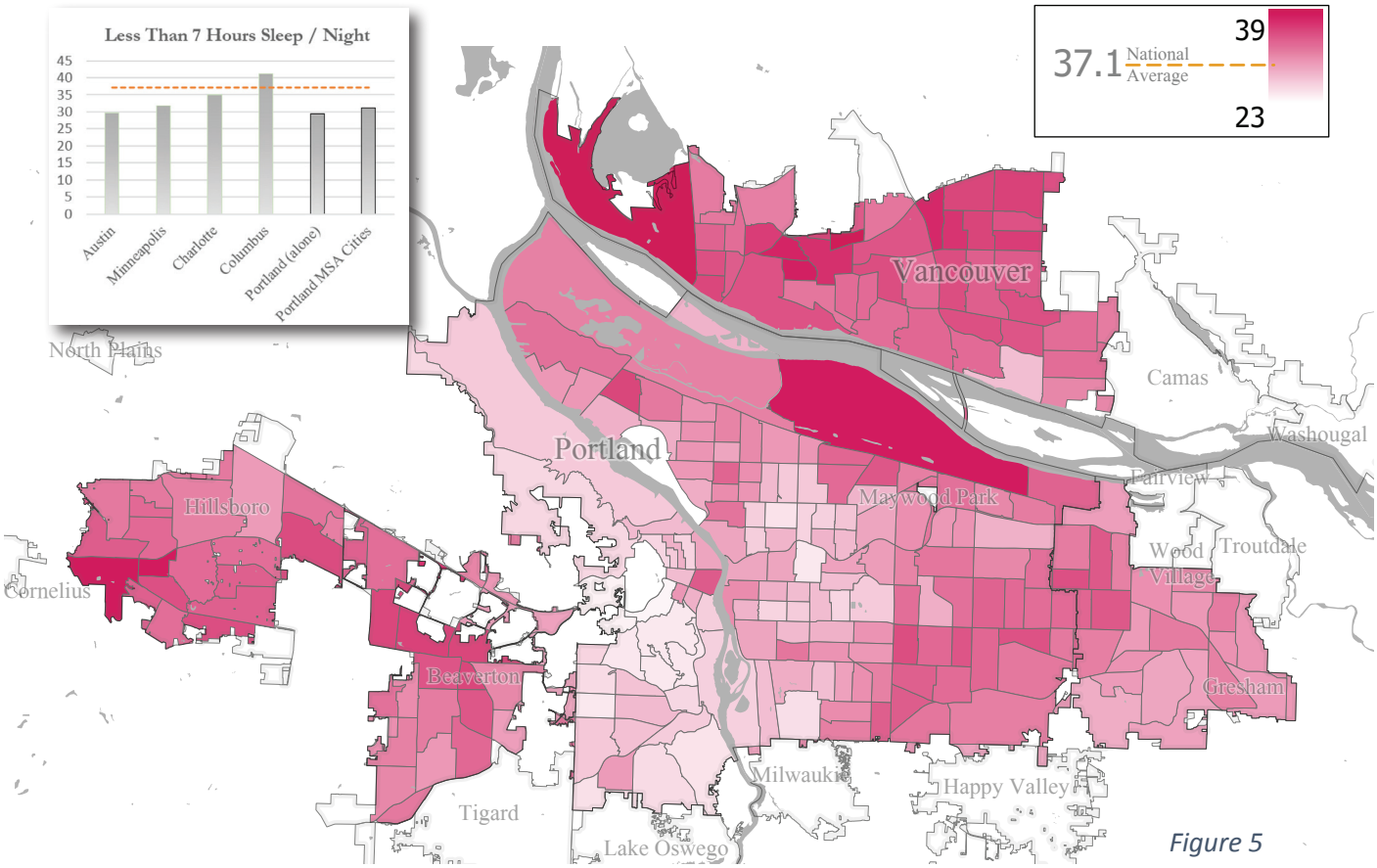

Figure 5

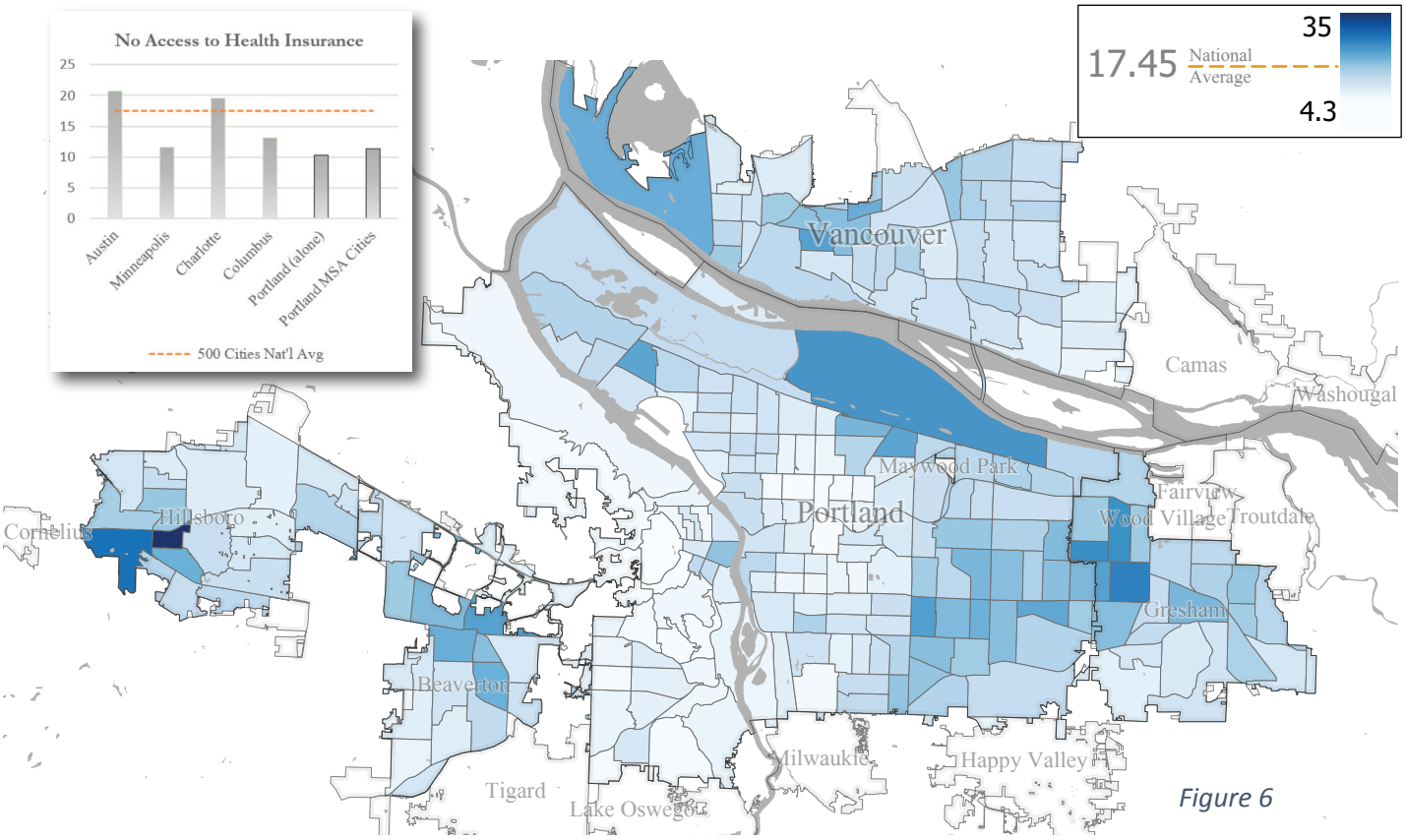

Figure 6

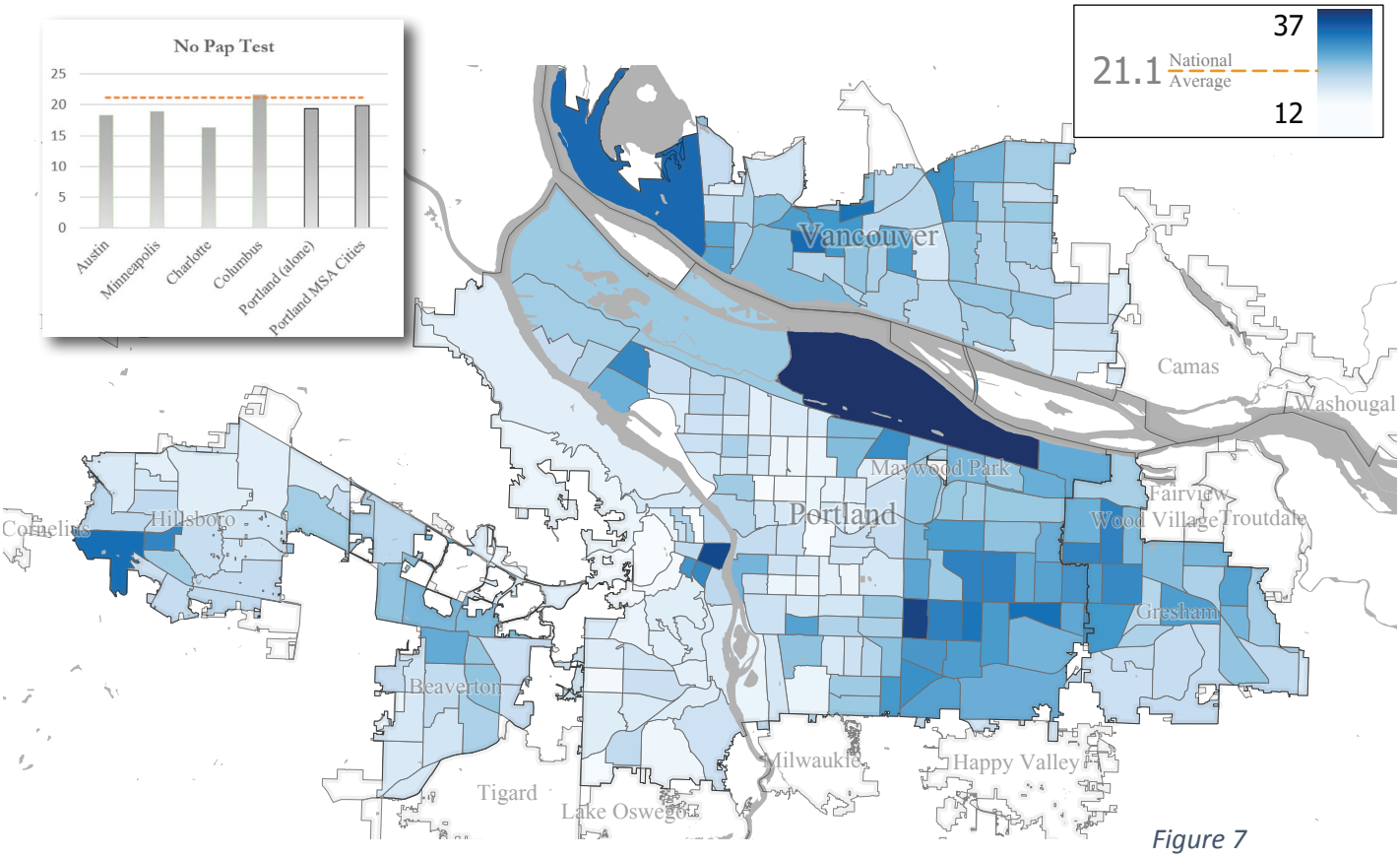

Figure 7

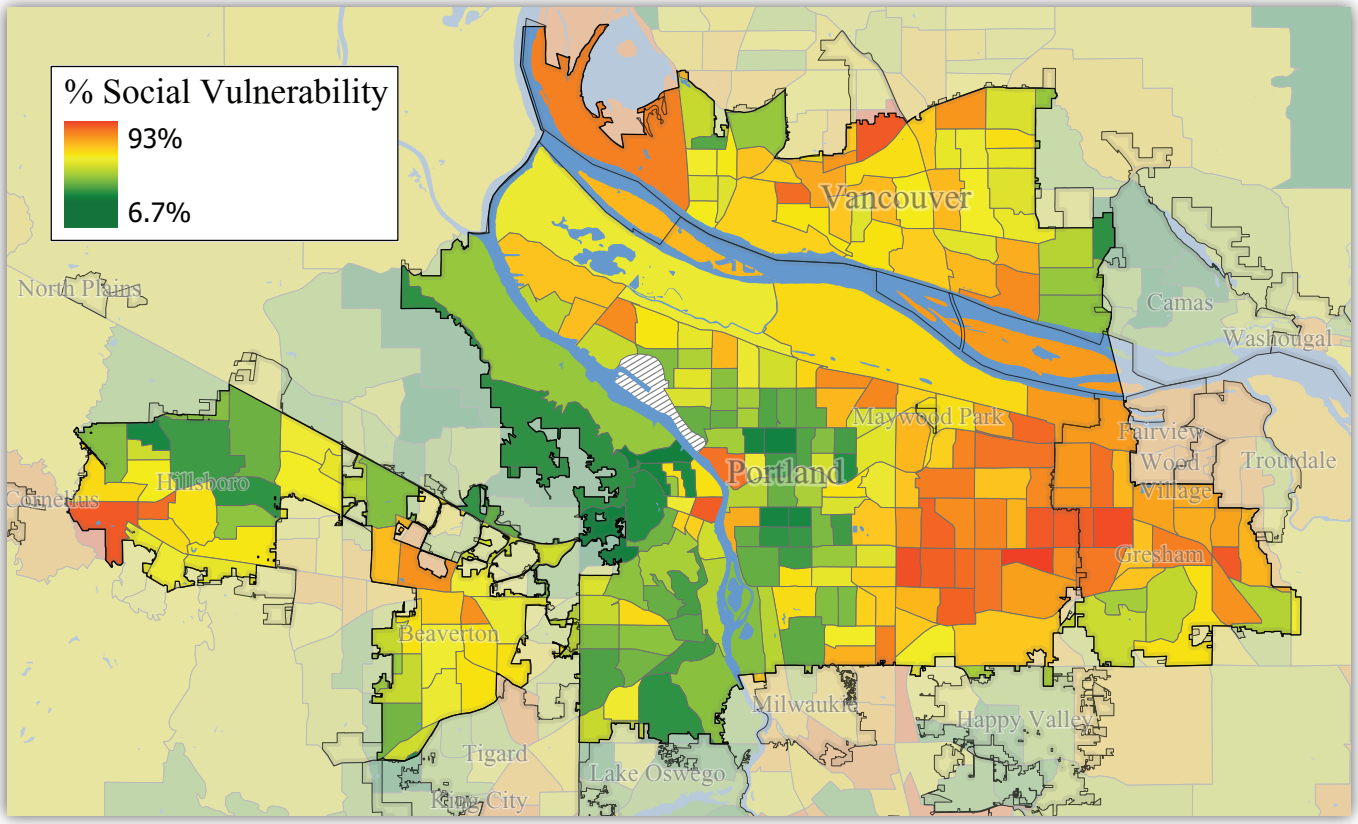

Figure 8

In 2018, IMS developed a Social Vulnerability Index, which represents a socio-demographic profile of vulnerability for local areas. The components that feed into the index come from the five-year American Community Survey (ACS):

- *Share of the dependent population (0–4 & 65 and older)*
- *Share of the population (25 and older) with a bachelor's degree or higher (negatively weighted)*
- *Share of the population that is White; not Hispanic (negatively weighted)*
- *Unemployment rate*
- *Share of the population with a disability*
- *Share of renter households that are cost-burdened (30 percent or more of income towards housing)*
- *Share of owner households that are cost-burdened (30 percent or more of income towards housing)*

For more information on our methodology visit opendata.imspdx.org. To access our social vulnerability web map, visit neighborhoodpulse.imspdx.org and search for "social vulnerability."

ties. As illustrated in the social vulnerability map, this maybe due to a number of factors such as less access to health services or experiencing poorer social, economic, or physical environmental conditions detrimental to residents' well-being.

Conclusion

The association between the concentrated health disparities and higher rates of social vulnerability are a strong indication of health inequities and warrant further exploration. Although there are limitations to the validity of spatial data, in combination with qualitative research, such as resident outreach, planners and officials can identify emerging health problems and develop targeted interventions to reduce health inequities experienced by the metro-area residents.